第 3 卷，增刊
1982年10月

动 物 学 研 究
ZOOLOGICAL RESEARCH

Vol. 3, Suppl.
Oct., 1982

青海蚤属一新种记述及其讨论
(蚤目：细蚤科)

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1980年10月于青海果洛州的鼠兔(*Ochotona*)上采获一批蚤类，经过鉴定，发现其中有青海蚤属(*Chinghaipsylla* Liu, Tsai & Wu, 1974)另一新种，兹记述如下。

宽指青海蚤 *Chinghaipsylla ampliodigita*, 新种

鉴别特征，详见表 1

表 1　宽指青海蚤与双窦青海蚤的特征比较

特征 \ 种别	宽 指 青 海 蚤	双 窦 青 海 蚤
♂抱器突形状	宽，除端部外、前后两缘几平行	窄，向端部逐渐细缩
♂基节白鬃	2 根，位近不动突端部	2 根，远离不动突端部
♂第 8 腹板后缘	圆凸	平直
♂第 9 腹板后叶结构	略呈鸭嘴背甲片状，直	略呈葵形，弯
♀第 7 腹板后缘	呈锥形突，下有深窦	呈指形突，上下均有深窦

种的记述　头、胸、腹三部有不少构造近似双窦青海蚤，♂♀头部构造参阅图 1、2。值得注意的是触角梗节的长鬃♀在外侧而多，♂在内侧而少(图 3)；♂有额鬃列，♀则消失，附近的微鬃不计。前胸栉刺两侧共16—18根；前、中、后足胫节后缘基本上依次具有 6，7，7 个切刻，但在中下切刻之间，常有 1 — 2 个小切刻；后足基节内侧沿前缘自上至下散布细鬃，股节外侧尤其靠近后缘 1 列鬃 6 —12根，第 2 跗节长端鬃♂超、♀不达第 5 跗节之半；腹部中间背板各具 1 列鬃，一般 4 根长鬃，气门下无鬃；中间腹板各有 2 (3) 根鬃；臀前鬃稍向下移，♂ 2 根（其下小鬃不计在内），♀ 2 — 3 根。♂第 8 背板退化而小，第 8 腹板后端呈半圆形，其腹侧稍前具 1 长椭圆绳圈状构造（图 6）；抱器体甚小，后延上倾成为不动突，外侧浑成一大骨片，2 根基节白鬃位于后缘后突上，不动突内侧具 1 纵槽，分为前后 2 叶，颇为别致（图 5）；可动突上半部长方形，其前缘有尖的骨化角突，后缘上有鸟嘴状骨化构造，下为 1 列 7 — 8 根鬃，上位

本文1981年 4 月13收到。

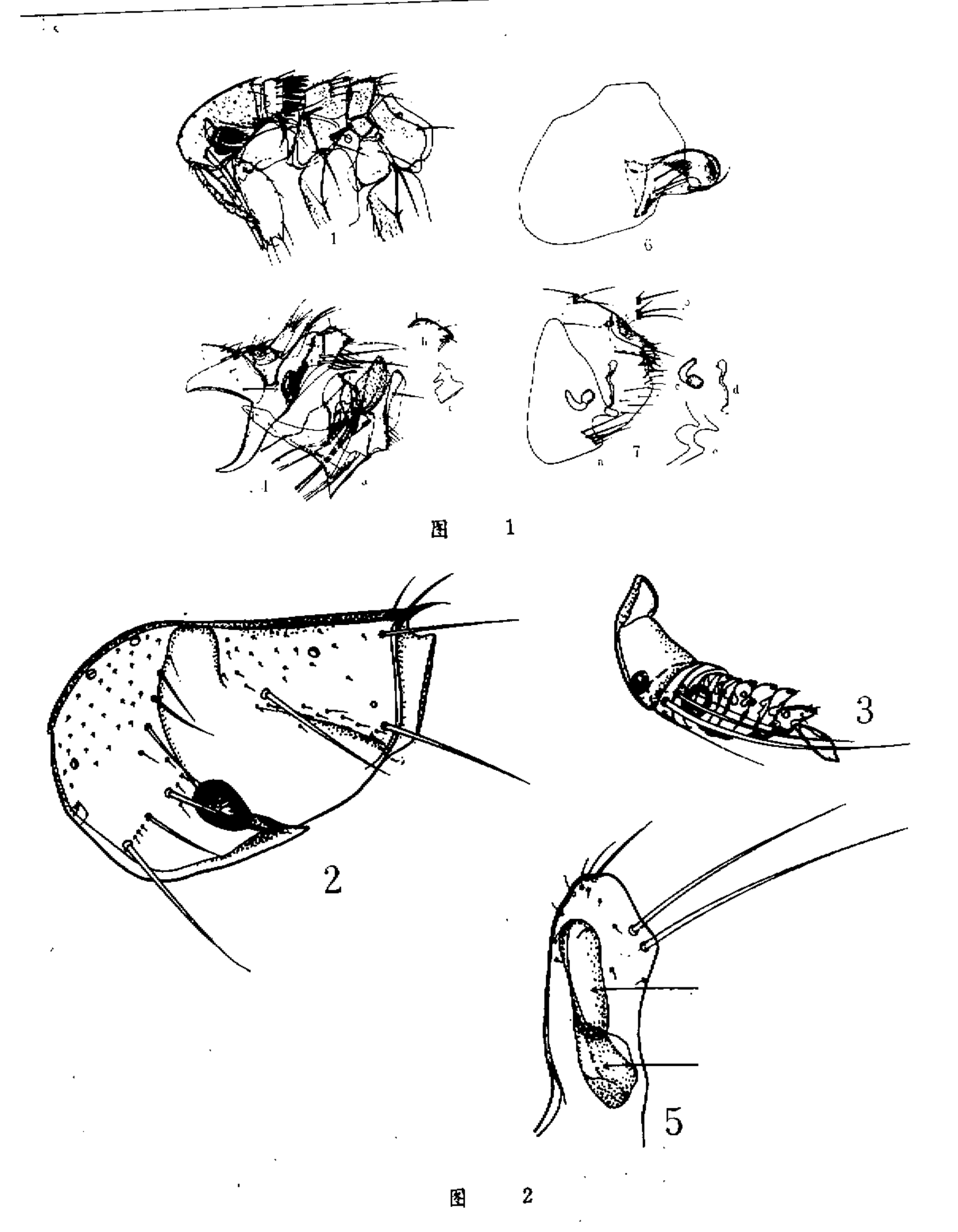


图 1

图 2

鬃特长；下半部逐渐细缩，因此可动突略呈菜刀形（图4）；第9腹板后臂末段分为2叶，前叶瓢形，后叶略似鸭嘴的背甲片而中凹；阳茎端等构造，参阅图4。♀第7腹板后缘具1半圆大窦，主鬃列通常4根鬃，比较密接，有时上方还有2根短鬃，间距大；肛锥梯形或筒形，长约为宽的2倍余，端鬃下的侧鬃1—3根（以上见图7）。其余参

阅鉴别特征和附图。

标本记录：正模♂，体长2.4毫米；配模♀，2.7毫米；副模2♂♂，3♀♀（♂2.7—2.8，♀2.4—3.0毫米）均于1980年10月由第一作者采自玛沁县军功（海拔3,500米）的红耳鼠兔（*Ochotona erythrotis*），标本分存于果洛州卫生防疫站和军事医学科学院。

青海蚤属属征的修订　本属第二个新种的发现，为修改补充属征提供了有利的条件。

鉴别特征　本属有不少独特的特征，不同于双蚤族内其它各属。（1）体鬃少，前足基节中区无鬃，腹部各背板仅具1列鬃；（2）触角梗节均有长鬃超过棒节末端，♀在外侧而多，但♂在内侧前半部而少（共3—4根，只1根粗长）；（3）中胸背板显长于前、后胸背板；（4）♂第8背、腹板均退化而小，第7腹板特别发达而大，取代前者复盖着大部分外生殖器的基部；（5）抱器体向后延为不动突，后者外侧完整，内侧有槽，分为前后两叶，颇为特殊；可动突略呈菜刀形，上后角具鸟嘴状骨化齿；抱器体及其3突（加柄突）联结成为倾斜的宽带形构造；（6）第9腹板后臂末段分为2个复杂的构造，前叶瓢形，着生许多感器和小鬃，后叶形状视种而不同(以上参阅图4)。（7）♀交配囊管呈拉长的“了”字形，受精囊头略呈椭圆形，尾腊肠形，尾长于头（图7）。

此外，还有一些次要的属征如下。有额齿位于额缘中点之下；眼卵圆色深无腹凹；额鬃列♂3—4根，沿角窝前缘，下位鬃较大，可能代表另一列，♀者已全消失；后头前两列鬃仅存1根粗鬃；无颊栉。中胸背板有假鬃，后胸背板和前3个腹节背板各有端小刺1个；后胸侧杆和侧拱发达。腹部气门下无鬃。

讨　论

青海蚤属♂蚤触角梗节内侧着生几根长、短鬃，这是一个新发现；与此相对应，♀蚤基腹板外侧中后方具有许多骨化细直条纹，推测它们在交尾时起着辅助固定♂蚤触角的作用，这是耐人寻味的事情。

本属♂蚤不动突发达，外侧虽特异，但内侧均具1狭槽，这是又一个独特的构造。按其位置和构造，这槽很可能在交尾时用以容纳♀蚤第7腹板后缘的后突，起着加强固定的作用。这比一般蚤类♂性仅用不动突和可动突夹持♀蚤第7腹板的后突有了进一步的发展和特化。

第9腹板前臂结构一般，但后臂分为前后两叶，分别呈瓢、匙形，颇为特化。前叶似被阳茎端的骨化环所围护，瓢表遍布感器和鬃，显然是一感觉器官；后叶略呈匙形；上述两叶的基部均以纤弱的骨化杆连接于后臂上，当然控制它们动作的肌肉组织早在制片过程中腐蚀消失，推测它们在交尾时可以自由转动，有可能起着象吸盘似地紧扣♀尾体表的定位作用。此外，第8、9腹板之间的节间膜也很发达，向上向后扩展，满布微刺，与第7腹板重迭覆盖着近半部的外生殖器，替代了退化的第8背、腹板，起着覆盖和保护部分抱器、第8、9腹板和阳茎端的作用。

总之，青海蚤属的形态是比较特化的，即使是体鬃减少退化，也是进化通过减缩的常

见现象，这在体内外寄生虫是司空见惯的。其它如外生殖器则特别复杂，有人认为蚤目的外生殖器不仅在昆虫纲中，而且也是在动物界中最为复杂的形态构造。因此，它们在分类上具有重要意义。对本属某些器官构造，作者不揣肤浅，抛砖引玉，略作上述的推测，是否合理，竭诚欢迎同志们的讨论指正。

参 考 文 献

柳支英、龚理芸、吴文贞　1974　我国青海省蚤目新属和新种的记述。昆虫学报，17：102—111，图1—11。

附 图 说 明

图1　宽指青海蚤 *Chinghaipsylla ampliodigita* sp. n. ♀蚤头和胸部（配模，青海玛沁）。

图2　宽指青海蚤 *Chinghaipsylla ampliodigita* sp. n. ♂蚤头部简图（正模。青海玛沁）。

图3　宽指青海蚤 *Chinghaipsylla ampliodigita* sp. n. ♂蚤触角，示梗节内侧长鬃（正模）。

图4　宽指青海蚤 *Chinghaipsylla ampliodigita* sp. n. *a*. ♂蚤变形腹节（正模）；*b*. 可动突末端；*c*. 阳茎钩突。

图5　宽指青海蚤 *Chinghaipsylla ampliodigita* sp. n.，♂蚤不动突内侧，示沟槽（正模）。

图6　宽指青海蚤 *Chinghaipsylla ampliodigita* sp. n.，♂第7、8腹板(正模)。

图7　宽指青海蚤 *Chinghaipsylla ampliodigita* sp. n.，♀ *a*. 变形腹节（配模）；*b*.臀前鬃变异；*c*.受精囊变异；*d*.交配囊管变异；*e*.第7腹板变异。

DESCRIPTION OF A NEW SPECIES OF *CHINGHAIPSYLLA* (SIPHONAPTERA: LEPTOPSYLLIDAE) WITH A DISCUSSION

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Chinghaipsylla ampliodigita sp. nov.

Diagnosis.

The new species is readily separable from its allied species, *C. bisinuosa* Liu, Tsai & Wu, 1974, by the following diagnostic characters. Male: (1) apical margin of St. Ⅷ hemispherical instead of being coneave-straight in *bisinuosa*; (2) process of clasper broad with its two margins subparallel whereas that of *bisinuosa* is tapering upwards; (3) posterior lobe of apical portion of distal lobe of St. Ⅸ somewhat resembling the upper piece of duck-bill whereas that of *bisinuosa* is rhomboidal in shape. Female: (4) apical margin of St. Ⅶ with a conical lobe and a large roundish sinus below it whereas in *bisinuosa* there is a fingerlike lobe with large sinuses above and below.

Types.

Holotype a male, allotype a female and 2 male and 3 female paratypes, all taken in October, 1980 off *Ochotona erythrotis* from Jun Gong, Ma Qin county in southern part of Qinghai province, China. Types are deposited in Guo Luo Zhou Health & Anti-epidemic Station and Academy of Military Medical Sciences.

Revision of the genus *Chinghaipsylla*

The genus possesses a number of unique characters separable from other genera of the tribe Amphipsyllini. These are; (1) body with far less number of bristles on bead, thorax and abdomen, the central part of forecoxa is without bristles and only 1 row of bristles is present on each abdominal tergite; (2) outer surfacc of pedicel of female antenna with long bristles reaching beyond apex of club, male with only 1 long bristle and few shorter ones on inner surface of pedical (fig. 3); (3) mesonotum distinctly longer than either pronotum or metanotum (fig. 1); (4) T Ⅶ and St. Ⅶ of male much reduced in size (fig. 4); (5) St. Ⅷ of male greatly developed covering basal parts of genitalia

(fig. 6); (6) body of clasper very small slanting upwards merging with its fixed process with 2 acetabular bristles on posterior margin of process which is very peculiar in that there is a groove on its inner surface (fig. 5); (7) distal half of movable process rectangular in shape with an apical sclerotized tooth on dorso-posterior angle, basal half of fixed process rather narrow and the whole clasper with its 3 processes more or less like a tape (fig. 4); apical part of distal arm of St. Ⅸ with 2 lobes of which the anterior is dipper-shaped with numerous sensoria and bristles (fig. 4) and the posterior lobe varies with the species concerned. Female: (9) bursa copulatrix looks like a stretched numeral "3"; (10) bulga of spermatheca somewhat oval and hilla sausage-shaped and longer than bulga (fig. 7).

Discussion

Morphological peculiarities of certain male structures are discussed. One long and few short bristles are borne on the inner surface of the pedicel of male antenna. It is a new feature hitherto unknown in the order of fleas. In coordination to this structure, the basal abdominal sternite of female bears on its latero-posterior part many fine striae. These striae are assumed in coitus to clasp the few bristles borne on the inner surface of the pedicel of male antenna.

Another peculiarity is concerned with the groove present on the inner surface of the fixed process of clasper. It was long known that the fixed and movable processes are used to clasp the 7th sternite of female during copulation. We conjecture that this groove may possibly be used to hold and fix the process of female for further strengthening. It is a step toward further specialization.

The two dipper- or spoon-shaped lobes of tge distal arm of the 9th sternite of male are also of special interest. Both of them seem to link to the distal arm through sclerotized tendon-like structures. We infer that these may rotate, say 90—180 degrees, through muscle control and become pigeonholded onto the outer surface of the female terminalia in copulation — another step of the male to hold firm the female.

In short, the genitalia of *Chinghaipsylla* are very complicated and await further detailed study.